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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/310,598	05/12/1999	K. DEREK SHAEFFER	STFD.005PA	9042

7590 11/16/2004  
CRAWFORD PLLC  
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MENDOTA HIEGHT'S, MN 55120

EXAMINER
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LUGO, DAVID B

ART UNIT	PAPER NUMBER
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2637

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Advisory Action</b>	Application No. 09/310,598	Applicant(s) SHAEFFER ET AL.	
	Examiner David B. Lugo	Art Unit 2637	

**--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

THE REPLY FILED 20 September 2004 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

**PERIOD FOR REPLY [check either a) or b)]**

- a) ☐ The period for reply expires \_\_\_\_\_ months from the mailing date of the final rejection.
- b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.  
ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on \_\_\_\_\_. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.
2. ☐ The proposed amendment(s) will not be entered because:
- (a) ☐ they raise new issues that would require further consideration and/or search (see NOTE below);
  - (b) ☐ they raise the issue of new matter (see Note below);
  - (c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
  - (d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: \_\_\_\_\_

3. ☐ Applicant's reply has overcome the following rejection(s): \_\_\_\_\_.
4. ☐ Newly proposed or amended claim(s) \_\_\_\_\_ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
5. ☒ The a) ☐ affidavit, b) ☐ exhibit, or c) ☒ request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.
6. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.
7. ☐ For purposes of Appeal, the proposed amendment(s) a) ☐ will not be entered or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: 2-5 and 11-28.

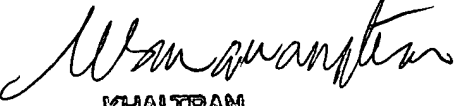
Claim(s) objected to: \_\_\_\_\_.

Claim(s) rejected: 1 and 6-10.

Claim(s) withdrawn from consideration: \_\_\_\_\_.

8. ☐ The drawing correction filed on \_\_\_\_\_ is a) ☐ approved or b) ☐ disapproved by the Examiner.
9. ☐ Note the attached Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_.
10. ☐ Other: \_\_\_\_\_

Continuation of 5. does NOT place the application in condition for allowance because: applicant's arguments are not persuasive. Regarding applicant's arguments with respect to claim 1, as noted in the final Office action, the periods where the activity of the digital processing unit is reduced corresponds with a "reduced-activity mode" occurring at a first interval, and the periods where the activity of the digital processing unit is not reduced is considered a "communication mode other than the reduced-activity mode" occurring at a second interval. Upon reviewing the language of claim 1 referenced by applicant, the fact that the activity of the digital processing unit is reduced during transmission and/or reception of radio signals does not suggest that the aforementioned "other" communication mode occurring at a second interval is equal to the first reduced-activity mode. In actuality, it is the time between the transmitting and receiving operations of the communications unit that the digital circuitry is in the normal operating mode, i.e. communication mode other than the reduced-activity mode (see Berthoumieux, last sentence of page 1 of Engl. transl. - attached herewith), and the analog portion of the circuitry is active during both the periods of transmission and reception of information, at which times the digital circuitry is placed in a reduced activity state. Regarding applicant's arguments with respect to claim 8, it is noted that Berthoumieux discloses in the middle of the last paragraph starting on page 3 of the English translation that clocks associated with the A/D converter are relatively slow clocks, and that the digital processing unit contains at least one very fast clock 7. Further, it is well established that an advantage of FIFO memories is that they allow independent buffering, allowing for difference in clock speeds of a device writing to the memory and a device reading from memory. It is thus considered obvious to use a memory with asynchronous read/write capabilities in the invention of Berthoumieux to benefit from said advantages attained by using such a memory. Finally, it is noted that a copy of the English translation of the Berthoumieux reference was sent to applicant with the Office action mailed 12/31/02, as indicated by the Form PTO-892 attached thereto. Nonetheless, the translation is being attached herewith for applicant's convenience, and in addition, the reference has been along with the entire contents of this application have been scanned and is available to applicant via the private Patent Application Information Retrieval (PAIR) system.

  
KHAI TRAN  
PRIMARY EXAMINER 11/10/04

PTO 02-3435

European Patent No. 0 447 302 A1

**RADIO-COMMUNICATION DEVICE WITH TIME-DIVISION MULTIPLEXING**

**Didier Berthoumieux and Michel Lambourg**

**UNITED STATES PATENT AND TRADEMARK OFFICE  
WASHINGTON, D.C. JULY 2002  
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EUROPEAN PATENT OFFICE  
EUROPEAN PATENT NO. 0 447 302 A1

Int. Cl. <sup>5</sup> :	H 04 B	1/16
	H 04 Q	7/04
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Country:	France	
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Date of Publication of the Application:	September 18, 1991 Bulletin 91/38	
Designated Contracting States:	AT, BE, CH, DE, DK, ES, GB, IT, LI, NL, SE	

RADIO-COMMUNICATION DEVICE WITH TIME-DIVISION MULTIPLEXING

[Dispositif de radio communication à multiplexage dans le temps]

Inventors:	Didier Berthoumieux Michel Lambourge
Applicant:	Matra Communication

The present invention relates to a radio-communication device with time-division multiplexing, and more particularly to a device which is intended to be used as radio terminal in a radio-communication network with time-division multiplexing. This radio terminal which is mobile, stationary or portable will be called mobile station in the rest of the description in order to distinguish it from the transmission base connected to a wired network.

It is known that in a radio-communication network with time-division multiplexing, the mobile stations are equipped with a radio-communication device allowing transmission and receiving of radio signals separated by intervals of time. These intervals of time between the transmission and the receiving associated with a mobile station are used to advantage by the

network in order to proceed with a transmission or receiving associated with another mobile station.

To this effect, there are known radio-communication devices which have an antenna, a transmitter-receiver component coupled with the antenna, a channel selection component associated with the transmitter-receiver component, an analog/digital converter associated with the channel selection component, a digital processing unit associated with the analog/digital converter and a time control component in order to control a speed of functioning of clocks associated with the digital processing unit and with the analog/digital converter. With improvement of the technology, the speed of functioning of the clocks has increased considerably, which has made it possible to increase the processing speed of the digital processing unit. One thus arrives at speeds of functioning of the clocks which are such that low order harmonics, for example, harmonics of order two or three, of the frequency of functioning of the fastest clocks are in the vicinity of the frequency of radio-communication of the mobile station with a stationary transmission base. For example, for a radio-communication network functioning at carrier frequencies in the 68-88 MHz band, one currently uses clocks functioning at 40 MHz whose order two harmonic is in the vicinity of the carrier frequency at which the transmission is carried out.

Such a similarity of frequency creates disturbances of functioning of the radio-communication device. In particular, the radio signals received by a mobile station are generally low level, and their receiving is disturbed by the functioning of the clocks of the digital processing unit, while the transmission of radio-communication signals by the mobile station is on the contrary very high level and risks disturbing the functioning of the digital processing unit. In order to avoid such disturbances, the digital processing unit is generally separated from the components used for transmission and receiving by means of shielding. Such shielding is expensive and detrimental to the flexibility of installation of the different components inside the mobile station.

An aim of the present invention is to propose a radio-communication device which does not have the disadvantages of the earlier devices.

In view of the realization of this aim, one provides, according to the invention, a radio-communication device with time-division multiplexing for transmission and receiving of radio signals separated by intervals of time, this device having have an antenna, a transmitter-receiver component coupled with the antenna, a channel selection component associated with the transmitter-receiver component, an analog/digital conversion component associated with the channel selection component, a digital processing unit associated with the analog/digital conversion component and a time control component in order to control a speed of functioning of clocks associated with the digital processing unit and with the analog/digital

conversion component and some means for reducing the activity of the digital processing unit during transmission and/or receiving of radio signals. Thus, during the instant when the activity of the digital processing unit is reduced, one decreases the magnetic disturbances which could influence the transmission or receiving.

According to an advantageous version of the invention, the reduction of activity of the digital processing unit is obtained by lowering the speed of functioning of at least one clock associated with this digital processing unit.

Thus, during the instants when the functioning of the components associated with the fast clocks could disturb the receiving of the radio signals or be disturbed by the transmission of the radio signals, the difference in frequency between the clocks and the carrier frequency of the radio signals is increased, and the corresponding disturbances are thus minimized.

Other characteristics and advantages of the invention will appear upon reading of the following description of a particular non-limiting embodiment of the invention in connection with the single accompanying figure which represents a block diagram of the communication device according to the invention.

In reference to the figure, the radio-communication device with time-division multiplexing according to the invention has antenna 1, transmitter-receiver component 2 coupled with the antenna, channel selection component 3 associated with transmitter-receiver component 2. Analog/digital conversion component 5 associated with the channel selection component 3 is also connected to time control component 4 containing a master clock connected to one or more clocks of the channel selection component in order to ensure a speed of functioning of these clocks as a function of the usual needs of this component. Digital processing unit 6 intended for ensuring the decoding of the information items received in their digital form or the encoding of the information to be transmitted is connected to analog/digital conversion component 5 as well as to time control component 4. While the clocks associated with analog/digital conversion component 5 are usually relatively slow clocks which do not create a disturbance on the received signals and which are not disturbed by the transmitted signals, digital processing unit 6 generally contains at least one very fast clock 7 whose own frequency, or low order harmonics of this frequency, is in the vicinity of the carrier frequency of the radio signals. In order to avoid the disturbances described above which result from the similarity of the frequencies, one provides, according to the embodiment which is illustrated, some means of detection 8 of the instants corresponding to transmission or receiving of radio signals in order to control a lowering of the speed of functioning of clock 7, or of the fast clocks associated with the digital processing unit during these instants or a part of the these instants. In the case in which the instants of transmission or receiving of radio signals are not determined a priori, for example, in the case of a mobile station which is not in permanent contact with a stationary transmission base and/or

which is capable of being quite variable distances from the stationary transmission base, the means of detection of the instants of transmission and receiving are preferably used during the learning phase during which the mobile station is synchronized with the stationary transmission base and is thus informed of the instants of receiving and transmission. A part of the information necessary for determining these instants, for example, the separation between the instants of transmission and the instants of receiving and the duration of the transmission and of the receiving can possibly be introduced in a permanent manner in digital processing unit 6 or in time control component 4 at the time of manufacturing of the radio-communication device or at the time of its initial use.

It is known that the digital data processed by digital processing unit 6 are data which are put in memory coming out of analog/digital conversion component 5. The degree of lowering of the speed of functioning of the clocks of digital processing unit 6 will therefore essentially depend on the nature of the components making possible putting of these data in memory. In the case of static storage components, it will be possible to go as far as complete stopping of the clocks of the digital processing unit, while for dynamic storage components, it will be necessary to maintain a minimum speed of functioning in order to avoid loss of stored data.

Of course, the invention is not limited to the embodiment described above, and execution variants of it can be provided without leaving the scope of the invention. In particular, although the invention has been described in connection with a device which has an analog/digital conversion component separate from the channel selection component, the invention is also applied through a radio-communication device in which the analog/digital conversion component is integrated in the channel selection component in particular when the analog/digital conversion component is integrated in an automatic gain control loop.

Likewise, the invention has been described in a simplified manner with a single line ensuring the transmission and receiving, but it can be used with a radio-communication device which has a transmission line and a receiving line which are separate, the two lines then being associated with a shared management component which is also used for determining the times when the speed of functioning of certain clocks must be lowered.

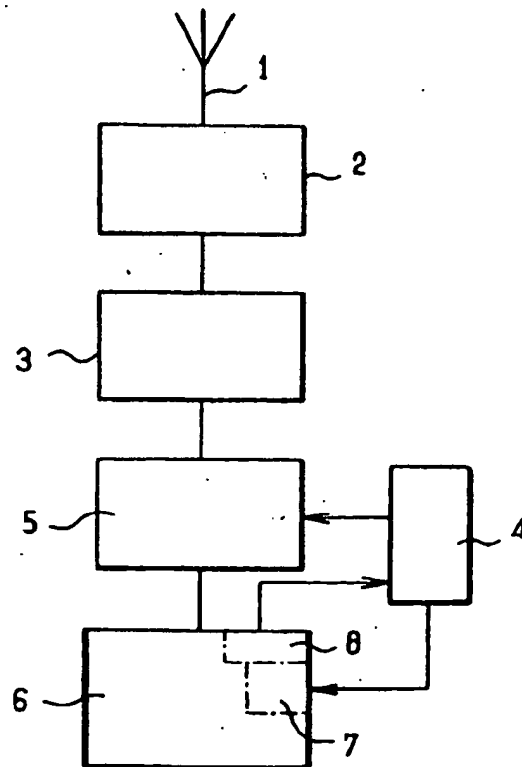
Although the invention has been described in connection with a device in which the lowering of activity of the digital processing unit is obtained by a lowering of the speed of functioning of certain clocks, this lowering of activity can be obtained by other means, for example, by performing tasks of rapid computation by an internal microprocessor or by an external circuit whose functioning is reduced or even interrupted during the critical periods without acting on the speed of functioning of the clocks.



### Claims

1. A radio-communication device with time-division multiplexing for transmission and receiving of radio signals separated by intervals of time, this device having antenna (1), transmitter-receiver component (2) coupled with the antenna, channel selection component (3) associated with the transmitter-receiver component, analog/digital conversion component (5) associated with the channel selection component, digital processing unit (6) associated with the analog/digital conversion component and time control component (4) in order to control a speed of functioning of clocks associated with the digital processing unit and with the analog/digital conversion component, characterized by the fact that it has some means for reducing the activity of the digital processing unit during transmission and/or receiving of radio signals.

2. A radio-communication device according to Claim 1, characterized by the fact that the reduction of activity of the digital processing unit is obtained by lowering of the speed of functioning of at least one clock (7) associated with this digital processing unit.



European  
Patent Office

Application Number  
EP 91 40 0632

### EUROPEAN SEARCH REPORT

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. <sup>5</sup> )
X	PATENT ABSTRACTS OF JAPAN Vol. 9, No. 61 (E-303) (1784) March 10, 1985 & JP-A-59 200537 (NIPPON DENSHI DENWA KOSHA) November 13, 1984 * the whole document *	1, 2	H04Q7/04 H04B1/16 H04M1/72
Y	IEEE INTERNATIONAL SYMPOSIUM ON CIRCUITS AND SYSTEMS Vol. 2, June 1988, ESPOO (FI) pages 1803-1810; E. KUISMA et al.: "Signal Processing Requirements in Pan-European Digital Mobile Communications" * page 1804, paragraph 3 - page 1806, right column, line 20 * * page 1808, right column, line 18 - page 1809, right column, line 32 *	1, 2	TECHNICAL FIELDS SEARCHED (Int. Cl. <sup>5</sup> ) H04Q H04B H04M
Y	EP-A-343528 (FUJITSU LTD.) * column 2, lines 30-54 * * column 3, line 35 - column 6, line 27 *	1, 2	
Y	EP-A-315260 (PHILIPS) * column 3, line 1 - column 4, line 32 * * column 5, line 12 - column 6, line 28 *	1, 2	
The present search report has been drawn up for all claims.			
Place of search THE HAGUE		Date of completion of the search JUNE 20, 1991	Examiner GERLING J.C.J.
<b>CATEGORY OF CITED DOCUMENTS</b> X: Particularly relevant if taken alone. Y: Particularly relevant if combined with another document of the same category. A: Technological background. O: Non-written disclosure. P: Intermediate document. T: Theory or principle underlying the invention. E: Earlier patent document, but published on, or after the filing date. D: Document cited in the application. L: Document cited for other reasons. &: Member of the same patent family, corresponding document.			